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Photograph © Oscar Marcus from Black Star

DEFYING GOOD MOSLEM MANNERS, HE SHORT-CUTS STRAIGHT TO THE TEA POT

With prayer beads around his neck, this Arab sheik has started to Mecca on the once-in-every-lifetime religious pilgrimage of Mohammedans. Like other Moslem pilgrims, he carries his own food, even on shipboard. To avoid touching anything that infidel hands may have defiled, it is the custom to drink from the curving arc of liquid gushing from the tilted tea pot, instead of touching the spout. Mohammed warned his followers against wine, so their usual refreshment is tea or coffee (Bulletin No. 4).

HOW TEACHERS MAY OBTAIN THE BULLETINS

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Chungking: China's Western Fortress Capital

THE stream of refugees pouring from Hankow last month, while Japanese bombers battered down the floodgates of Chinese resistance, fled westward by river and air to safety in Chungking, the official last-resort capital of China.

This deep-inland refuge of the Chinese government is 1,500 miles up the Yangtze from the coast. It is sheltered in the giant bowl of Szechwan Province, 218,000 square miles of isolation in the middle of west central China. Mountain barriers hem the province in so steeply that the opium poppy is a leading cash crop; only lightweight exports, such as opium, can be sent to the outside world at a profit exceeding freight charges. Drug firms have headquarters in Chungking to buy up the highly taxed opium and other medical products, including dried rhubarb. Tung oil (used in varnishes) is also an important export.

City Is an Up-River Shanghai

A city of more than a half-million, Chungking perches like an eagle's nest on the ledge of a cliff. A stone wall 100 feet high and five miles around shuts it in, with only eight of its seventeen fortified gates open to traffic. On three sides the gray cliff city's foundations drop away another 100 feet to the river curling around its base. Stone staircases 20 feet wide, not streets, slant steeply down from the rampart gates to the river landings.

So important are waterways in this rugged province that Chungking has become a trade metropolis through the lucky fact of being a port at the juncture of the Yangtze River and the Kialing River. Chungking serves as a center for the network of important Yangtze tributaries which give Szechwan Province its name of "Four Rivers."

The city, halfway up the Yangtze, has some of the modern qualities of Shanghai at the river's mouth, and its shops display the tapestries and jewelry of Tibetan mountain regions where the river has its origin. Missions make Chungking headquarters for work in China's rugged west, and consulates here handle the wholesale trade of a deep hinterland.

Yangtze Gorges Only Gateway from East

The only way into Chungking from eastern China is the Yangtze, and the Yangtze is the only way out. A new air service from Hong Kong has been interrupted by the war. There is no railroad. A bus service over a new road to Yunnan-fu, in the south, gives Chungking a route to join the railroad through French Indo-China to the port of Haiphong.

Chungking is virtually the western limit of navigation for Yangtze steamers. Special flat-bottomed boats are necessary for year-round traffic. Below the city the Yangtze plunges a treacherous and unruly course through the mountains of central China. Here steep gorges 2,000 feet deep confine the river, fine to see but murderous to navigate, for it is one of the most dangerous stretches in the world on which steamship traffic maintains a schedule.

Steamboats were put to work on this stubborn stretch of river as early as 1898, only seven years after Chungking was opened by treaty to foreign commerce. But junks of ancient design are still more generally used, though they may require more months for the up-river trip than a steamer takes days. With as much as 50 tons of freight, junks are towed upstream through the gorges by coolie "trackers"—China's Volga boatmen.

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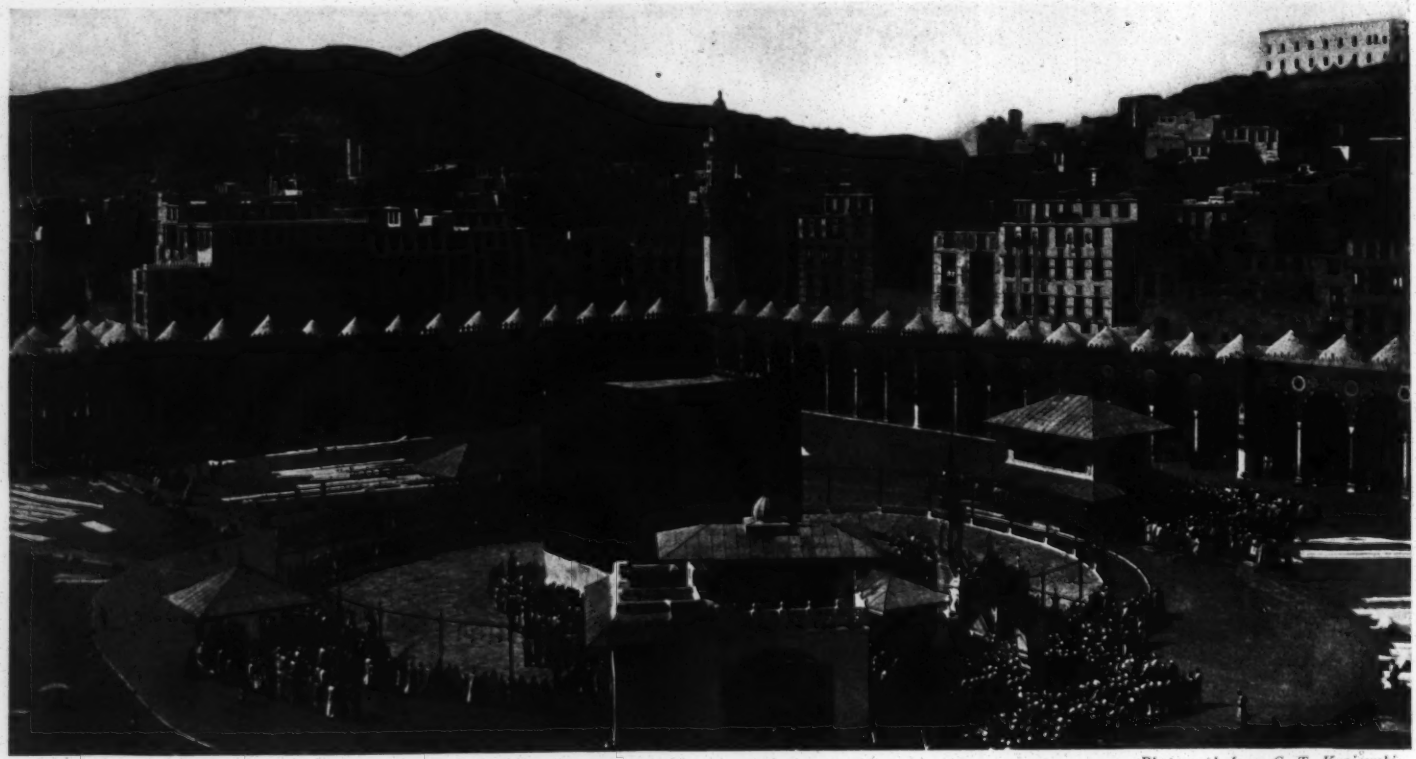

Photograph from G. T. Krajewski

ONE PERSON OUT OF EVERY TEN ON EARTH FACES TOWARD THIS SQUARE FIVE TIMES A DAY

Goal and symbol of the Moslem world is the Kaaba, covered with its holy carpet (center). This is the final shrine of the pilgrimage which every able Moslem should make, no matter from what part of the world. After reaching Mecca, the pilgrim enters the colonnade, circles the inner shrine seven times, drinks from the well of ZemZem (in the white temple), and finally enters the Kaaba as the climax of his whole religious life (Bulletin No. 4).

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Poetic License Embroiders Coleridge's Geography

A HIKE through the English countryside in November, 131 years ago, inspired a poem that has had a disturbing influence over both literature and geography ever since—"The Ancient Mariner." Three hikers—William Wordsworth, his sister Dorothy, and Samuel Taylor Coleridge—decided to pay expenses for their 35-mile stroll through the Quantock Hills of Somerset, along the Bristol Channel, by composing a poem to sell.

What could be a more interesting subject than a journey, the journeyers thought. By the time they reached the village of Watchet, they could see the sails of ships beating down the Bristol Channel; the poem's journey embarked on a ship. And at the inn of Watchet, on November 13, 1797, the thrifty travelers sat up late plotting its course.

Finally all but Coleridge were asleep, and the poet was half a world away from the tiny English port, launched on as fantastic a voyage as any mariner ever related.

Seventeenth Century Geography Survives in Rhyme

Coleridge and his yarn-spinning Ancient Mariner have branded the Pacific as a region where "slimy things did crawl with legs upon the slimy sea," and where there is "water, water everywhere, nor any drop to drink." Every explorer of Antarctic waters has had to confirm Coleridge's story that "ice, mast-high, came floating by as green as emerald," and to deny that the albatross was the fateful bird "that made the breeze to blow."

To English literature Coleridge may be a bright star, but to the realm of geography he is an aurora borealis. The eerie and fitful light of his poems has flickered over geographic fact like an electrical disturbance. His readers pore in vain over the map of China for Xanadu and Alph the sacred River; search Ethiopia for the mysterious Mount Abora, the secret of whose location has never been revealed by that singing "damsel with a dulcimer."

A broad, black-lettered creamy page of an old geography lay on his lap as Coleridge drifted into the vision he recorded as "Kubla Khan: A Fragment." Samuel Purchas, a preacher in Essex, wrote it in the geography-hungry days of 1613, under the quaint title of *Purchas His Pilgrimage: or Relations of the World.*

Could Write Poetry Only in Somerset

The drowsy poet's finger marked his place in Chapter 13, "Of Tartars and Cathayans," where a paragraph began: "In Xaindu did Cublai Can build a stately Pallace, encompassing sixteene miles of plaine grounde with a wall, wherein are fertile Meddowes, pleasant Springs, delightfull Streames, and all sorts of beasts of chase and game. . . ." From there, the poet pushed on in his trance, and found the prosy realm of "Kubla Khan" an enchanted vista of incense-bearing trees, caves of ice, sunless caverns measureless to man, and romantic chasms haunted by wailing women and demon lovers.

Glamorous Xanadu (Shang-tu), site of the fabulous Khan's summer splendor, today is believed to be the dusty village of Kai-ping, some 40 miles northwest of Peiping in bleak North China, too trifling to merit map space. Alph, the sacred river, which never flowed across any real map of China, rushes on through an uncharted channel strangely suggestive of the Nile.

This geography of fantasy took shape against a background of the pleasant coastal hills and coves of southwestern England. For Coleridge was a West-coun-

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River traffic brings Chungking such foreign wares as watches, matches, sewing machines, and even automobiles.

Chungking's markets are supplied from typical Szechwan farms, laid out in strips of terrace to the tops of hill slopes on angles up to 45 degrees. Summer rains are caught to flood the terraces for thin strips of rice fields, like slivers of mirror pressed into the hillside. The same land during winter may produce wheat in tidy rows with beans planted between. The province produces its own tea and mulberries for its own silk.

Mountains around Szechwan Province hold summer humidity in so long that farming is possible for eleven months of the year, but fogs and mist make the climate gloomy. The isolation and gloom are both hinted in the Chungking proverb, "Dogs bark at the sun and other strangers."

Note: Additional information, maps, and photographs (both black and white and in color) about China will be found in "Four Thousand Hours over China," *National Geographic Magazine*, May, 1938; "China's Great Wall of Sculpture," and "Hong Kong, Britain's Outpost in China," March, 1938; "The Rise and Fall of Nanking," February, 1938; "Landscaped Kwangsi, China's Pictorial Province," December, 1937; "Changing Shanghai," and "Peacetime Plant Hunting Around Peiping," October, 1937; "Grand Canal Panorama," April, 1937; "Approach to Peiping," February, 1936; "Capital and Country of Old Cathay" (duotone insert), June, 1933; and "From the Mediterranean to the Yellow Sea by Motor," November, 1932.

Bulletin No. 1, November 14, 1938.

Photograph by Robert F. Fitch

BRINE AND BAMBOO GIVE CHUNGKING SALT TO SELL

Located 1,500 miles inland from the salt industry of China's coast, Chungking's salt trade is supplied largely from brine wells of Szechwan Province. A thousand wells cluster around Tzeliutsing, some of them dating back to the third century B.C. They have been sunk deep into the earth by primitive iron tools. Buckets or tubes of bamboo on long cables of bamboo strips are lowered into the wells, then hauled up on a man-powered windlass, and the brine is evaporated for salt. Larger wells have water buffalo to turn the wheel.

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Lithuania Offers Olive Branches to Germany and Poland

LITHUANIA, often at odds in recent years with Germany and Poland, has decided to patch up its differences with these neighbors, according to news reports from the Baltic republic.

At a meeting of Lithuanian officials held in Kaunas, the capital, last month, it was decided that (1) martial law will be made less severe in the Memel district (which has a large German population), and (2) henceforth Lithuania would "soft-pedal" claims to the 10,000 square miles around Wilno, former capital of Lithuania, seized in 1920 and held since by Poland.

The friendly policy of Kaunas brings into the picture a Baltic capital that has been isolated for many years by quarrels. When Warsaw seized Wilno, Lithuania closed its border to Poland, and refused to permit any sort of communication, either by train, telephone, telegraph, highway, or airplane. Not until the first of July, 1938, was this ban lifted and the disputed border crossed by a train.

Kaunas Steps Out as Stand-In

Poland's seizure of Wilno, just after both nations had broken away from 120 years of Russian czarist rule, meant that Kaunas, as the largest city left in the country, had to be pressed into service as capital of Lithuania. With a population of 130,000, it stands near the small-size end in a line-up of the world's national cities. But only five towns have more than 10,000 inhabitants in Lithuania, where three-fourths of the people are farmers.

Since greatness has been thrust upon it, Kaunas has blossomed from a backward Russian garrison town (then called Kovno) into a typical European capital in miniature. New government buildings have the clean, forceful lines of modern style construction. New streets are wide, with trim ranks of lime trees shading their promenades. Blocks of new apartment houses flaunt their new freedom from a Russian decree that dwellings should be no more than two stories high.

Yet visitors exclaim that old cobbled streets, many-domed churches and droshkylike carriages resemble Czarist Russia's. They comment that the potato, flax, and grain fields beyond the city limits resemble Ireland's. They remark that Kaunas' tall fair people resemble Englishmen, and the Lithuanian replies that he comes from a blond Aryan branch of the human family, distinct from his Slavic neighbors in Poland and Russia.

Nation Lacks Fuel, Except Peat from Bogs

Before Kaunas attained national attention as capital, it had been a center for river commerce throughout the nine centuries of its existence, for it stands where the little Neris flows into the Nemunas River, the Rhine of Lithuania. The city's name comes from Lithuanian for "battlefield." Battles of many armies have raged around Kaunas, and the city has been burned thirteen times.

A few old structures survive to testify to prosperity of the medieval days when Kaunas shipped Lithuanian amber, furs, honey, leather, and timber to Scandinavia, and to Europe's Low Countries. Possibly the oldest is the House of Perkunas, so called because it stands on the site of a pagan shrine to Perkunas, god of the thunderbolt and chief deity of Lithuania until thirteenth century German knights came to "Christianize" the country with the sword.

The capital city shares in the nation's industries, which employ, however, only

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try lad, who found no inspiration when he left his "dim coasts, and cloudlike hills, and shoreless ocean." In the village of Ottery St. Mary in southern Devon he was born, a poor but learned preacher's thirteenth spoiled child (October 21, 1772). At his father's death, he was sent to the charity school of London's Christ's Hospital; shifted to another homesickness at Cambridge University where "Cam rolls his reverend stream along."

Trips abroad educated Coleridge, but did not inspire him. At Hamburg he was conscious only of a "confused sense that I was for the first time in my life on the continent of our planet." Although he traveled by coach in Germany, aired his asthma for fifteen months on the sunny island of Malta, and toured Italy to see some of the "noblest productions of human genius," it was the western arm of England that made him a poet.

It was the two years he lived and wrote in the hamlet of Nether Stowey, among "seaward Quantock's healthy hills," that gave Coleridge his fame. His home, a small thatched cottage at the western end of Lime Street, was so crowded with visitors, boarders, children, work, and genius that in the congestion his wife Sara spilled a skillet of boiling milk and scalded the poet's foot, making "This Lime-Tree Bower my Prison" until the burn healed. Yet, when he moved north to the more spacious Greta Hall at Keswick, in the Lake District, all he acquired was rheumatism. His final eighteen years in London, as a vacationing "archangel, a little damaged," produced so little poetry that he called them in his epitaph "death in life."

Note: Information about some of the places where Coleridge lived and where his poetic fancy roamed is contained in "Within the Halls of Cambridge," *National Geographic Magazine*, September, 1936; "Informal Salute to the English Lakes," April, 1936; "Maltese Islands," November, 1935; "Down Devon Lanes," May, 1929; and "World's Greatest Overland Explorer" (Marco Polo), November, 1928.

See also the Modern Pilgrim's Map to the British Isles, copies of which are available at 50 cents (paper) and $1.00 (linen).

Bulletin No. 2, November 14, 1938.

Photograph by A. W. Cutler

IN COSY SOMERSET, COLERIDGE "FOUND" THE WILD PARADISE OF XANADU

Near the snug village of Porlock, the poet had his fantastic dream of the "sunless sea" and "caverns measureless to man" and the mighty fountain in a haunted chasm. A visitor from Porlock was the fatal interruption which left the poem of *Kubla Khan* forever a fragment. The village was kinder to Southey, who wrote his verses in the chimney corner of the Ship Inn (above).

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"Moslem World" Includes One of Every Ten Persons on Earth

IN THE present Palestine revolt against British authority, Arabs claim, according to news dispatches, to have the support of the "entire Moslem world." Last year, when Mussolini toured the Italian dependency of Libia, North Africa, Moslems presented to the Fascist leader a symbolic "Sword of Islam." (Islam refers to the religion of the Mohammedans or Moslems.)

What *is* this "Moslem World" so frequently mentioned in today's headlines?

Roughly, some 250,000,000 people—or more than one out of every ten inhabitants of the earth—are adherents of the faith of Allah and his Prophet Mohammed.

Most Moslems in Africa and Asia

Although most Moslems live in Asia and Africa, the United States, including the Philippines, counts nearly 600,000 of them. Central and South America contribute a total of around 200,000. The Balkans add another 3,000,000, while Soviet Russia's latest available figure was set at more than fifteen millions.

In the thirteen centuries since the Arab reformer, Mohammed, first attempted to teach his doctrines to the citizens of Medina and Mecca, the followers of Islam have multiplied to take in Turks, Iranians, East Indians, Malays, Negroes, Chinese, and many inhabitants of southeastern Europe.

Outlined without a break is Islam's greatest concentration, which blankets all of north and much of central Africa, and stretches down the east coast of that continent to below Zanzibar. Crossing into Asia, Islam reaches deep into the heart of the Soviet Union. Scattering land-islands of "believers" to the west in Balkan Europe, Mohammedanism sweeps on its eastward course through all of Turkey, the Near East, Arabia, Iran, northwest India, and western China. It dots the open sea in islands off the coast of India, and is especially strong in Netherlands Indies.

Youngest of the three major monotheistic faiths—Judaism, Christianity, and Mohammedanism—Islam in name means "submission," submission to the will of Allah or God.

Dogmatic forms govern the lives of the disciples of Islam, rules based on Mohammed's bible of moral and political laws—the Koran. Profession of faith, almsgiving, prayer, fasting, and the holy pilgrimage, especially to Mecca, are demanded by the ritual. Wine and pork are forbidden. To the Mohammedan, the world is divided into pure and impure matter, the latter including certain animals, bodies of the dead, and "Infidels," and it is considered defiling for a believer to touch any of them.

Good Mohammedans believe that upon death they go to a heaven of beautiful houris (nymphs), palaces, and gardens of flowers and flowing water—especially appealing to men of the desert.

Religion of "Holy War"

Taking lessons from Hebraic and Christian religions of the Middle Ages, Mohammedanism abandoned the old Arab idea of many gods for the doctrine of unity and supremacy of God, retaining, however, various angels and genii. As the new belief expanded, after the death of its political and mystic leader, it split—like Christianity—into numerous sects, the major groups being the Sunites and the Shiites.

Between these two divisions, bloody and bitter warfare was carried on. For Mohammedanism makes no concessions to the idea of universal human brotherhood. On the contrary, the Koran orders its followers to hate and destroy the unbeliever, glorifying the principle of "Holy Wars."

Under the banner of a militant faith (such as characterized the Christian Crusades in later centuries), Arab tribes early united to conquer much of the Near East, north Africa, and Spain. With them they carried to Europe, still groping in the Dark Ages, a torch of advanced scientific learning and a marked trading genius.

Mohammedanism—putting into practice its church-state idea—crystallized into three vast Islamic empires, Arab, Turkish, and Mongol, which later were broken up into separate Moslem nations.

Today, although certain leaders call for a reunited Moslem front, many of these countries have turned instead to Westernized programs of nationalistic economy, in which religion has small voice.

Turkey, once the heart of Islam, has completely divorced religion from the state, putting her faith rather in "Five-Year Plans," modern machines, and votes for women. In the general

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6 per cent of the population. The limited extent is due to scarcity of fuel other than peat from the swampy country's bogs. Coal is imported from England. Kaunas has its cider mills for apples from neighboring orchards, flour mills and breweries for grain crops, a large packing plant for cattle from surrounding pastures. Down the Nemunas River float spruce and pine logs for the lumber enterprises of the city, which turn out furniture, veneer, and cellulose. Metal-working industries produce farm machines to replace Lithuania's hand sickles.

The fervor of long-suppressed Lithuanian patriotism has endowed Kaunas with a number of new show places: the National Museum, with portraits of plumed warriors of Lithuania's medieval history; the Ciurlionis Art Gallery, where prompt tribute is paid to the country's leading artist, the late M. K. Ciurlionis.

The War Museum, staffed by disabled veterans, has a carillon from Belgium companioned by a real American liberty bell sent over from the United States. The former home of the poet Meironis is now headquarters for recording the nation's folk songs, the *Dainos*. Over 4,000 of these traditional songs are stored in the museum on phonograph records—song of the spinners turning native flax into thread, song of the goose girl driving her flock on their own tar-protected feet to market, song of couples swinging in the Swallow Dance. "More musical than the Italians" is the verdict of Dainos students on the nation which produced such a wealth of song.

Note: Additional material about Lithuania can be found in "Flying Around the Baltic," *National Geographic Magazine*, June, 1938; "The Battle-Line of Languages in Western Europe," February, 1923; and "The Races of Europe," December, 1918.

See also in the GEOGRAPHIC NEWS BULLETINS: "Ancient Lithuania Smolders about Modern Boundaries," week of April 4, 1938; and "Memel, Lithuania's Door to the Sea," week of October 7, 1935.

Bulletin No. 3, November 14, 1938.

Photograph from Douglas Chandler

AMBER SERVES LITHUANIANS AS INDUSTRY AND JEWELRY

A Lithuanian legend tells how a sea goddess's big amber palace was smashed to pieces by her angry father, and the glowing yellow fragments still wash up on Lithuania's shores. At Kaunas the amber is made into jewelry for export and for a flash of color in the national costume. At Kaunas also, young wearers of that costume may attend their national university for classes conducted in their native language, which a Russian decree once outlawed from their homes under penalty of 300 rubles fine.

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Gran Chaco Peace More Than Doubles Area of Paraguay

WHILE the 100,000-square-mile triangle of Gran Chaco was in dispute between Bolivia and Paraguay, the rest of Paraguay was the smallest of all the South American republics—61,647 square miles. Peace terms between the two nations last month awarded to Paraguay 91,800 square miles of the hotly contested Chaco, giving the country a total area of 153,447 square miles. Paraguay is now larger than Uruguay and, possibly, larger than Ecuador, whose boundaries and area are still unsettled.

The peace agreement was reached through the efforts of six umpires, who arbitrated the boundary question in the names of the Presidents of Argentina, Brazil, Chile, Peru, Uruguay, and the United States. The final treaty followed a two-year truce, and closed exactly three years of the bloodiest steel-and-gunpowder trench warfare that has yet scarred South America.

Landlocked Bolivia Wins Exit by Water

The prize for which that war was fought was the broad flat triangle of the Gran Chaco, outlined by the two rivers, Paraguay and Pilcomayo, which unite at the Paraguayan capital city, Asuncion. For Paraguay, this wedge of wild country —dark matted forests, marshes, and thorn-blanketed plain—offered room to expand forest industries and cattle raising. For land-locked Bolivia, the region would offer right of way for a pipe line to take Bolivian oil towards South America's east coast, or at least access to the navigable Paraguay River.

The boundary line which the peace umpires drew around the embattled Chaco gives each country what it was fighting for. Bolivia is assured possession of the oil lands in the far western Chaco around Capirenda. Also, Bolivians are granted free port rights at Puerto Casado on the Paraguay River, to which a railroad runs halfway across the Chaco. And to Paraguay goes 90 per cent of the disputed area.

The "west wing" newly annexed to Paraguay is shaped like an ice cream cone, with the tapering point at Asuncion. The eastern side of the cone stretches along the Paraguay River about 350 miles to the mouth of the Rio Negro, just above Bahia Negra. The western half is outlined by the shallow reed-choked Pilcomayo River up to Esmeralda, just below where the northern frontier of Argentina meets Bolivia at Fortin D'Orbigny.

"Chaco" Is Indian for "Hunting Ground"

The profile of the "ice cream" dome describes an arc from Esmeralda northeast to the Rio Negro through uninhabited wasteland, where landmarks are mainly forts. Names of frontier posts bespeak a region where grassy domes stand out on the horizon like peaks: Cerrito (Little Hill) Jara, Cerro (Hill) Chovoreca, Fortin (Fort) Paredes, Cañada (Marsh) del Palmar de Las Islas, Cerro Capitan Ustares, 27 de Noviembre, Villazon, Capitan Carreras Saguer. Fortin Ingavi and Lake Irindague are within the area.

The forest which smothered troop movements and made armored tanks useless in the Chaco war is the basis of one of the four industries being developed in the Gran Chaco, the "big hunting ground" of the Indians. Timber, plantations of cotton and sugar cane, pasture land for sheep and cattle, and possibly oil wells—since traces of oil have been reported—are lures offered to encourage colonists. One group already swallowed up in the great open spaces of the Chaco is the Mennonite band

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social objectives of Soviet Russia, her huge Moslem population of the East finds little room for religion of any kind.

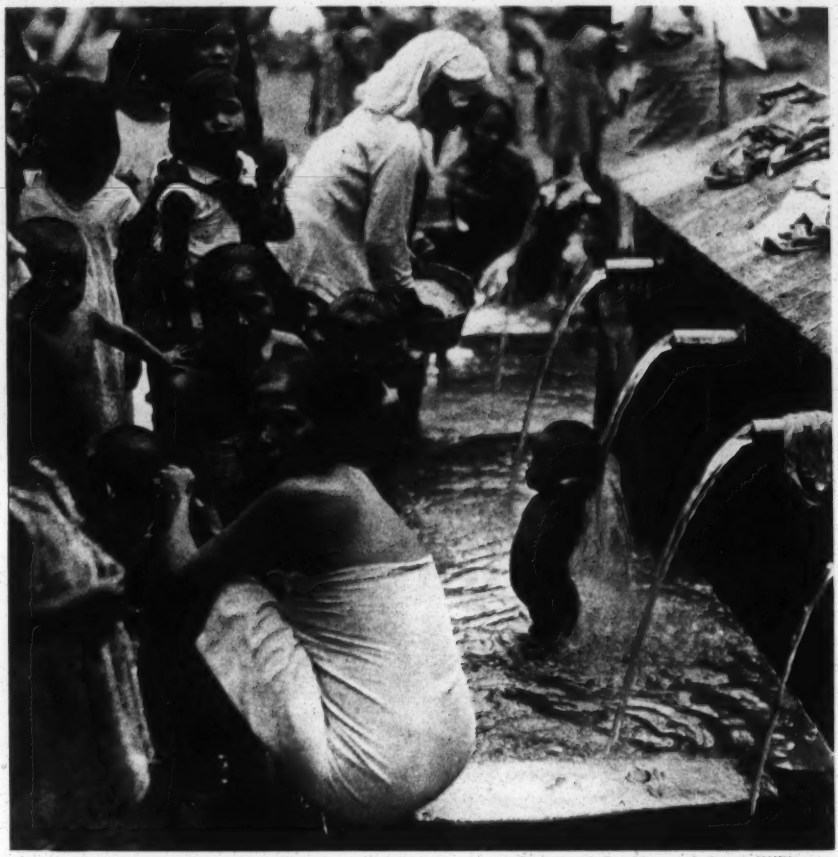
A new mosque to be opened in Edmonton, Canada, shows that Islam has not abandoned Western expansion. Brooklyn, New York, has another Mohammedan place of worship; while mosques are found in many European capitals, including London and Berlin. Especially interesting is a modern structure at Paris, built in 1922-24.

The ancient Great Mosque of Cordoba, Spain, built by the Moors in the 8th century on the site of a Roman temple and Visigothic church, is now used by Spanish Catholics.

Note: Articles in the *National Geographic Magazine* containing material about the Moslem world are "Pilgrim's Progress to Mecca," November, 1937; "Time's Footprints in Tunisian Sands," March, 1937; "Bedouin Life in Bible Lands," January, 1937; "Fez, Heart of Morocco," June, 1935; "Unbeliever Joins the Hadj," June, 1934; "Changing Palestine," April, 1934; "Road of the Crusaders," December, 1933; "Into Burning Hadhramaut," October, 1932; and "Summer Holidays on the Bosporus," October, 1929.

Next month's issue of *The Geographic* (December, 1938) will contain "Change Comes to Bible Lands," accompanied by a large wall map in colors showing the Moslem centers in this disputed region.

Bulletin No. 4, November 14, 1938.



Photograph by Maynard Owen Williams

MOSLEMS SEEK CLEANLINESS IN SUMATRA AS IN THE ARABIAN DESERT

The ceremony of bathing is important throughout the Moslem world, even in the waterless wastes where the devout rub their hands in clean sand before prayer. In the coffee town of Sipirok in Sumatra, Netherlands Indies, the ritual of cleanliness before prayer accounts for an abundance of water piped into this special mosque for women. Laundry lying behind the pipes shows how Sumatrans obtain ritual cleanliness for garments as well as their persons. These faithful Moslems, so far from Mecca, live among Christian and pagan neighbors.

that migrated in 1927 from Canada. Two thousand ranches with two million head of cattle are listed for the region, mainly within reach of the Paraguay River.

Five short railroad spurs were built within the past decade, totaling around 450 miles. The longest reaches westward from Puerto Casado, free port on the Paraguay.

Source of Quebracho, or "Ax-Breaker," Wood

Scourge of the Chaco, half the time, is water; no water the rest of the time. Summer rains from November through February convert narrow streams to lakes miles wide, and grazing cattle overtaken by floods on the range must swim to hummocks. Winter drought reduces the temporary lakes to mud holes, then to salt crusts, and travelers must carry water with them for 70 to 200 miles between wells.

This uneven water supply gives ribbons of tangled forest to the Chaco, alternating with strips of grass-covered plain or with cactus thickets in drier areas. Typical tree is the oaklike quebracho, from which tannin is extracted for tanning leather. Chief source of the tough quebracho ("ax-breaker") wood is the 400-mile-wide plain of the Gran Chaco, sweeping up from Argentine Pampas for 1,000 miles, to be split in the north between Paraguay and Bolivia.

Note: See also "Bolivia, Land of Fiestas," *National Geographic Magazine*, November, 1934; and "River-Encircled Paraguay," April, 1933.

See also in the GEOGRAPHIC NEWS BULLETINS: "'Marathon War' Resumed in the Chaco," week of January 29, 1934.

Bulletin No. 5, November 14, 1938.

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ONE LOG IS A WAGON LOAD IN CHACO LUMBER CAMPS

The timber industry in the Chaco, with several varieties of tropical hardwoods including the tough quebracho, is active only within reach of the Paraguay River because of the lack of roads. Heavy logs squared off where they are felled are hauled by oxen and a high-wheeled chassis across the flat Chaco plain to the river, with round logs serving as "bearings." Some of the timber is so heavy that lighter weight wood must be lashed to it to keep it afloat in the river. The sudden change from forest (background) to bare plain is due to differences in the amount of water held by the soil.

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